A NOTE ON THE FRESHWATER POLYCHAETE, *MANAYUNKIA SPECIOSA* LEIDY, FROM CALIFORNIA AND OREGON.[1, 2, 3]—The most westerly observed occurrence of *Manayunkia speciosa* Leidy is extended from Duluth Harbor, Lake Superior to California and Oregon. Evaluations are made of the methods of collection and habitat. A possible explanation for the occurrence of this organism on the Pacific coast is based on the introduction of eastern fish, taken from the type locality of *Manayunkia.*

Manayunkia speciosa (fig. 1) was collected in the Mokelomne River near New Hope Landing, Sacramento County, California in 1963, and specimens were also found in Sevenmile Canal, a tributary of Agency Lake, Klamath County, Oregon,

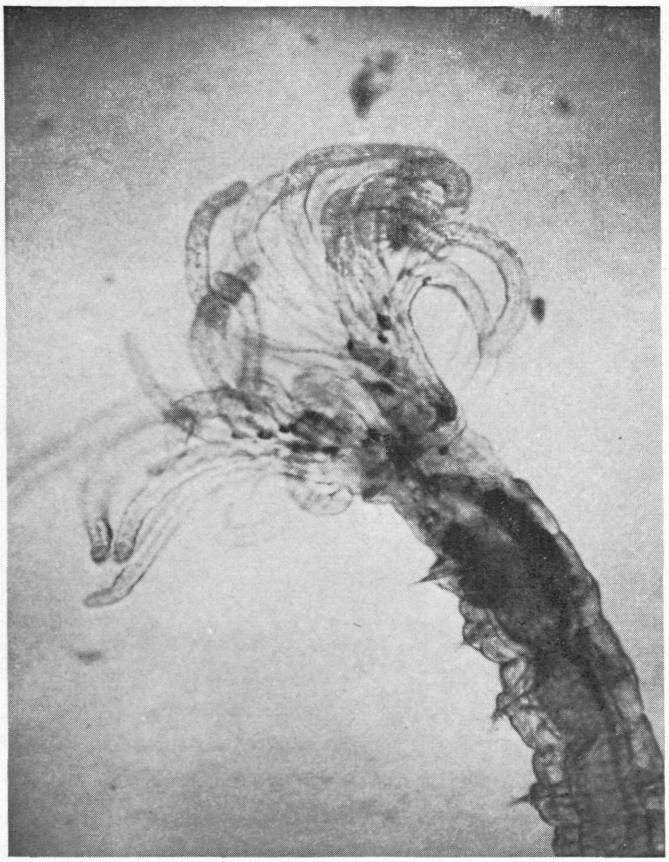

FIGURE 1. Anterior end of *Manayunkia speciosa* (life-size, 2.5 mm) from Sevenmile Canal, Oregon.

in 1964. Until this time the most westerly distribution records were from Lake Superior near Duluth (Meehean, 1929). The type locality of *M. speciosa* is the Schuylkill River, Pennsylvania (Leidy, 1858, 1883). Pettibone (1953) redescribed the species, and placed into synonomy *M. eriensis*, previously described from Lake Erie (Krecker, 1939). Pettibone concluded that the species is probably

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widely distributed, but escapes notice because of its small size. Also, it is greatly distorted when preserved in alcohol or formalin and, unless high magnification is used, it may easily be mistaken for a fragment of oligochaete.

The *M. speciosa* taken from the Mokelomne River (Hazel and Kelley, 1966) were in a sediment of medium sand with some silt. The river at this point is tidal, with a net downstream flow except during floods when flow is unidirectional. Another freshwater polychaete, *Neanthes limnicola* Johnson, was also collected at the same location, but not in the same samples. The identification of *M. speciosa* from the Mokelomne River was confirmed by Dustin Chivers of the California Academy of Sciences.

The identification of the Oregon specimens was confirmed by Marian H. Pettibone of the Smithsonian Institution. *M. speciosa* was found at one location just inside the mouth of Sevenmile Canal from Agency Lake. The canal has a discharge of about 100 cubic feet per second from marsh and reclaimed agricultural land. The substrate is peat and silt. Specimens were collected with a cone-type plankton net dragged along the bottom. The netted residue was searched under a binocular microscope while fresh. This method of collecting specimens proved to be more effective than using a dredge. For example, five samples were taken by the Ekman dredge and washed through a U. S. Standard No. 35 Seive. The retained peat was carefully searched for *M. speciosa*, but none was found. These results were similar to those reported by Britt (1965), who, using a 35 mesh-per-inch seive, found *Manayunkia* in 10 of 24 samples and concluded that many polychaetes may have passed through the seive.

Discovery of this species in two separate western river basins indicates that it is distributed in the watersheds of the Pacific coast as well as in those of the Great Lakes and eastern United States. However, eastern warm-water fishes were introduced into both the Sacramento and San Joaquin Rivers of California in 1874 (Smith 1896). These fish came from diverse locations in the eastern United States. In particular, the introduction of white catfish, *Ictalurus catus*, taken from the Schuykill River, Pennsylvania, the type locality for *Manayunkia speciosa*, seems to be most pertinent. These fish were transported from the Atlantic Coast in a railroad aquarium car and were released, at several locations, into the Sacramento-San Joaquin drainage in 1874. It is conceivable that *Manayunkia speciosa* was introduced into California at the same time. No record was found of the direct introduction of fish from the eastern states into Klamath Lake, but from Smith's paper (1896), it was inferred that introductions into the lake were made from stocks of California fish beginning in about 1880. Consequently, there is a chance that *M. speciosa* was also introduced to the Pacific coast from the East coast, by way of the Sacramento and San Joaquin Rivers. There are river systems in California and Oregon that supposedly have not received introductions of eastern aquatic life, and these will need to be searched in order to determine whether *M. speciosa* is endemic to the west-coast drainages.

Hiltunen (1965) estimated a population of 45,292 per square meter at the mouth of the Detroit River. Although the collections taken in California and Oregon were not quantitative, the species was relatively rare. In Oregon a tow of about 50 yards netted less than 100 specimens. An interesting parallel to Hiltunen's finding, that frequency of occurrence is influenced by the Detroit River, is that the California and Oregon records were from the mouth of streams.—CHARLES RICHARD HAZEL, *Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon.*

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